

United States Department of Agriculture,
DIVISION OF AGROSTOLOGY.

[Grass and Forage Plant Investigation.]

RAPE AS A FORAGE PLANT.

Throughout a large portion of the United States farmers and stock-raisers could advantageously grow more of the succulent forage crops for feeding stock during the summer and autumn months, when the supply of grasses and clovers is often limited. Such crops may usually be grown on land that has already produced an early matur-



FIG. 1.—Rape, grown at Mellette, South Dakota.

ing crop of some sort, such as oats, rye, or winter wheat. One of the best of these succulent crops is rape (*Brassica napus* Linn.), a plant closely related to cabbage, turnips, and several other garden and field crops.

DESCRIPTION.

Rape is much like the Swedish turnip or rutabaga in appearance, but the root is more like that of cabbage. The leaves are large, glaucous, smooth, spreading, and variously notched and divided; the flowers are bright yellow, nearly one-half inch in diameter; the seeds are produced in pods usually 2 inches or more long.

Under ordinary field conditions the plant reaches a height of from 1½ to 4 feet, and the strong-growing roots penetrate the soil to a considerable depth.

Rape is either annual or biennial. The annual varieties (summer rape) are grown chiefly for the seed, and have not been much cultivated in this country. The biennial varieties (winter rape) are used largely for forage.

NATIVITY, USES, AND EXTENT OF CULTIVATION.

Rape, like the turnip, is a native of northern Europe, ranging eastward into Siberia. Although it has long been cultivated in the Old World, it has received but little attention in America until within comparatively recent years, and is now much more widely grown in Canada than in the United States. Practically, all the rape grown in this country is the winter or biennial sort, but in Europe, especially in England, summer rape is widely cultivated. The seed yields about 33 per cent of expressed oil, which is of value for lubricating, and is also used for lighting. The compressed rape-seed cake is used as a food for stock and as a fertilizer. It is regarded as particularly valuable as a fertilizer for flax and turnips. The seed is much used as a bird food. In this country rape is grown almost exclusively for forage, being used chiefly for soiling and summer and autumn pasturage.

Rape is best adapted to rather cool, moist climates, such as prevail in portions of Canada and the northern United States. It can, however, be successfully grown as a forage crop in many of the warmer and dryer sections. Thus in favorable seasons or with a small amount of irrigation excellent crops of rape are grown in Wyoming, Montana, the Dakotas, and other States in the so-called semiarid region, and many instances are on record where good crops have been produced without irrigation, under conditions of drought so severe as to cause the failure of corn and other farm crops. In parts of the South rape may be grown for late fall or winter forage.

SOIL REQUIREMENTS.

For its best development rape requires a rich, moist, loamy soil, and will usually do well on any but light sandy soils and stiff clays, such soils being usually deficient in vegetable matter. In general a soil that will produce good crops of turnip, cabbage, wheat, and corn will be suitable for rape.

Rape is a gross feeder and draws quite heavily on the nitrogen as well as the mineral constituents of the soil, and hence should be used in rotation with crops that feed largely on other elements of plant food. For example, rape and fodder corn take about the same proportions of nitrogen, potash, and phosphoric acid from the soil, and

experience has shown that corn does not do well after rape, unless the land is naturally rich in these substances. Results obtained at the North Dakota Experiment Station indicate that the growing of a crop of rape on land that has been sown to wheat for a number of years produces a decided increase in the yield of wheat from the succeeding crop. This is a point of much value in regions where wheat is extensively grown.

VARIETIES.

All the varieties of rape that have come into prominence in American agriculture are winter or biennial sorts. Dwarf Essex or English rape has been most widely cultivated. Recently a variety has been placed on the market under the name of Dwarf Victoria rape, or simply Victoria rape, which has given excellent results in New England and also in the Northwest, yielding, as a rule, rather better than the Dwarf Essex. At the New Hampshire Experiment Station this variety is reported as yielding nearly 50 tons of green fodder per acre, and yields of 25 to 30 tons per acre are reported from South Dakota and elsewhere in the Northwest. Under average conditions a yield of from 10 to 20 tons or more may be expected from either of these varieties.

CULTURE.

Owing to the great variety of ways for utilizing rape and the many places it may occupy in the rotation of crops on the farm, there are numerous methods of culture that may be followed in growing it. When it is grown as the primary crop of the season the land should be prepared by deep and thorough plowing, preferably early in the preceding autumn. In some soils a second plowing should be given in the spring before the seed is sown, but in soils that are naturally loose and mellow, such as are found in portions of the Northwest, a simple stirring of the surface with a cultivator or disk-harrow will often be sufficient. The land should be well pulverized by harrowing before the seed is sown. When the land needs fertilizing barnyard manure may be applied before plowing in the autumn, or if the land is plowed twice the manure may be spread on during the winter or early spring before the last plowing. Commercial fertilizers may be applied by harrowing in at the time that the land is being pulverized previous to seeding. Whatever treatment the land is given in preparation for this crop it should be such as to afford a deep, mellow seed bed, as free as possible from noxious weeds.

SEEDING.

Throughout the Northern States generally, seeding may take place from the first of June or possibly earlier, to the middle or last of July, according to the season and locality. In the South the seed may

be sown in September or early in October. Under favorable conditions 2 to 3 pounds of seed per acre will be sufficient and it will never be necessary to use more than 5 pounds per acre. The seed should be planted in drills far enough apart to allow cultivation. In practice the distance varies, but it is seldom less than 20 inches nor more than 32; 24 to 28 being perhaps the most satisfactory, all things considered. For planting small fields any of the common garden drills will be found quite satisfactory, but for large fields a grain drill with some of the feed hoppers closed may be used. When the ground is clean and in proper condition otherwise, good results may be obtained by using the grain drill with all feed hoppers open, and giving no after cultivation. As a rule, however, it will be best to plant in wide drills and give sufficient shallow cultivation to keep the soil in good physical condition and destroy weeds. With favorable soil and climatic conditions, good crops of rape may be obtained from broadcast seeding, but whenever there is any danger of the surface soil becoming very dry during the time the seed is germinating or when land is at all foul, drilling will give much better results.

AS A CATCH CROP.

When rape is grown as a secondary or catch crop it will not often be possible to pay so much attention to the preparation of the soil and the time and method of seeding, and quantity of seed used may be varied to suit the circumstances. Often fine rape may be grown on land that has already produced a crop of some of the early maturing cereals, such as rye, oats, or barley. As soon as the crop of grain is removed, the land is plowed or "disked" and at once seeded to rape. Field peas and other early maturing forage crops, or rye or winter oats that have been pastured off in spring may also be followed by rape with profitable results.

Another practice which is coming into favor in some sections of the country is to sow rape in the spring with some grain crop, such as wheat, allowing the former to take possession of the field when the latter has been removed. This method is especially satisfactory when succulent forage is desired for fall feeding. Rape may also be sown in the cornfield just before the last plowing, as is often done with rye and winter wheat.

AS A WEED DESTROYER.

Aside from its value as a forage, rape is an excellent crop to grow on fields that are foul with weeds. The late date at which the seed may be sown allows the weeds to get well started before the final preparation of the soil begins, they are further kept in check by the cultivation required for the crop during its early growth and later

the rape plants shade the ground so completely as to keep the weeds down. An excellent treatment for a foul field is to plow thoroughly in late summer or early autumn and seed to rye or some other forage crop to be pastured off during the fall, winter, or early spring. When the crop has been pastured sufficiently and before the weeds have produced seed, plow again, plant rape in drills and give thorough cultivation. There are few weeds that will survive such treatment and the land will have given profitable returns in forage in the meantime.

HARVESTING AND UTILIZING THE CROP.

The rape is usually ready for use in about 8 or 10 weeks from the date of seeding. The general practice is to use it as a soiling crop or as pasturage. Sheep and swine may be turned into the field and allowed to remain until the rape is pastured off. Cattle may also be allowed to run in the field, but as they waste much of the forage by pulling up the plants and trampling them down it is a better plan to cut the rape with a scythe or mower and feed it to the animals.

With sheep and cattle care should be taken at first not to allow the animals to eat too much, as there is danger of injury from bloating. Hungry animals should not be allowed to eat their fill, and it is not best to turn them into the rape when the leaves are wet. There is no danger of bloating with swine. It is an excellent plan to have the fields so arranged that the sheep and cattle have access to an open pasture as well as to the rape. Animals should have free access to salt at all times when being pastured on this crop.

FEEDING VALUE.

Rape has a high feeding value. It makes an excellent feed for fattening sheep and swine and for producing an abundant flow of milk in milch cows. On account of danger of tainting the milk many people do not feed it to the cows until after milking. Rape can be used to good advantage as a part of the ration for animals that are being fed in pens for market or for the show ring. It is also a valuable food for young lambs at weaning time. By beginning as early as practicable in the spring and seeding at intervals of two or three weeks, a continuous succession of rape can be produced throughout the period when the permanent pastures are most likely to be short. Rape will endure quite severe cold weather and thus will last a long time after the ordinary pasture grasses succumb to the frost. By the use of this crop stock can be gotten into good condition for the holiday markets or for winter and there need be no check in growth, fat, and milk production through insufficient succulent food during the late summer and autumn months, as is too frequently the case.

Under favorable conditions two or three cuttings may be made in a single season from a field of rape grown as a primary crop. Mr. W. H. Heidman, of Kalispell, Mont., reports three cuttings the first season with a heavy yield of forage. He allowed the plants to stand the second season and obtained a fine yield of first-class seed. Not much attention has been paid to growing rape for seed in this country, possibly because of the fact that in most localities where this crop has been extensively grown the winters are so severe as to destroy the plants. It seems however that there are localities where rape can be profitably grown for seed and farmers might well devote more attention to this feature of rape growing since most of that now used is imported.

THOMAS A. WILLIAMS,
Assistant Agrostologist.

Approved:

JAMES WILSON,
Secretary of Agriculture.

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